

AMATEUR SATELLITE REPORT

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Shuttle Motor Test Thought To Be Successful

Some 19 months after the January 28, 1986 disaster that ended in the loss of the Challenger shuttle crew, NASA has successfully taken one great leap toward resuming launches of its Space Transportation System (STS). Testing of the redesigned solid rocket booster (SRB) had been scheduled for Thursday, August 27, 1987. Three problems at the test site in the Wasatch Mountains near Brigham City, Utah, caused the first full-scale test firing of the redesigned booster to be delayed. Computer software problems, a leaking cooling system and two problems with a few of the more than 500 sensors wired to the test rocket all combined to cause Morton Thiokol to delay testing. NASA was careful not to influence the decision to halt the test, insisting no short-cuts would be taken to get shuttle flights resumed.

Redesign of the booster segment field joints was directed by NASA following findings that a poorly designed joint was responsible for the Challenger disaster. Changes in the joint include addition of a third "O" ring, capture latch and permanent bonding. Engineers spent over one full year redesigning the sealing system for the 2.65 million pound thrust rocket motor.

Finally, at 3 PM on Sunday, August 30th, the giant booster roared to life, consuming 1.1 million pounds of rubbery propellant in a scant 120 seconds. It takes only one half second for the internal pressure to build to its maximum of 930 pounds per square inch.

First indications are that all went well, though it will take several weeks for the engine to be taken apart and studied. Engineers are cautiously optimistic, however. Six more such tests are expected before shuttle flights resume, possibly as soon as June 2, 1988. A crack in the case was discovered a few days after the test but this was attributed to a failure in a water cooling system not part of the SRB itself. The crack, although it raised some eyebrows, was said by Marshall Space Flight Center officials to probably not affect assessment of the overall test results due in a few weeks.

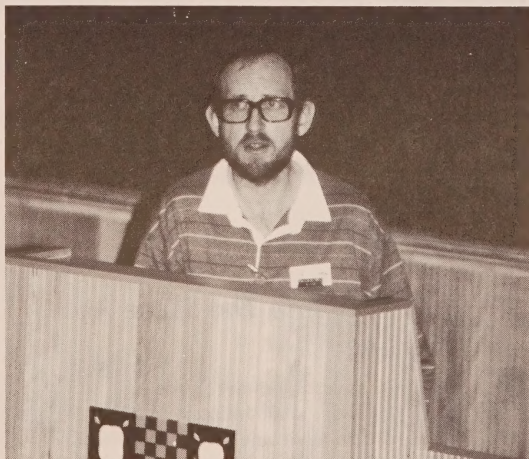
AMSAT is looking forward to the renewal of shuttle flights for several reasons. First, the EDSAT GAS can project of Richland Community College is manifested on the shuttle. Project officials are anxious to know when their launch will be scheduled. Moreover, several Shuttle Amateur Radio Ex-

periments (SAREX) are either ready to go or in the planning stages. Astronauts Tony England, WØORE, and Ron Parise, WA4SIR, are both anxious to add a SAREX package to their missions.

Space Station Budget Axe Wielded By Retiring Senator

According to a recent release from the National Space Society (NSS), the U.S. Space Station project may succumb to the budget axe of a well-known axe wielder. The "Emergency Alert" from the NSS dated August 17, cites a story from the August 10 issue *Aviation Week and Space Technology* magazine which says Senator William Proxmire, Democrat of Wisconsin, plans to cut off all Fiscal Year 1988 funding for the Station.

Proxmire, who has served in the Senate since 1957, recently announced he would not be a candidate for reelection. He is a well-known Senator who gained considerable notoriety for his "Golden Fleece" award given monthly to government agencies he felt earned it by virtue of fleecing the taxpayers with outlandish schemes. He has in the process drawn occasional fitful outbursts and rage



Graham Ratcliff, VK5AGR at the Surrey Colloquium July 18.

from many who believe he has gone too far in his zeal for fiscal "responsibility" in government. Opponents cite notorious short-sightedness among his characteristics.

This time it's the space advocates whose ox has been gored. With the Russian Mir Space Station a constant reminder of how far behind the U.S. has now fallen, Proxmire's parting gesture seems likely to have struck an especially sensitive nerve in the aerospace community and space advocacy groups alike.

AMSAT members who have views on the Space Station and the future of the U.S. space program in general may find this an appropriate opportunity to make those views known to their elected officials. The National Space Society is a newly formed organization of space activists and advocates which grew from the union last autumn of the National

on-air activities in the satellite (RS10/11 & FO-12) and terrestrial domains. Your suggestions are welcome.

OSCAR 1 was launched a little over 4 years after Sputnik. OSCAR 1 will be 26 years old this coming December.

Video Presentation Readied For Premier Airing

As we go to press, "The New World of Amateur Radio" video program is in final production and being readied for its premier airing September 20. Amateurs have been encouraged to tape it off the air for showing at club meetings and similar activities. The 30 minute show is co-hosted by Roy Neal, K6DUE. Appearances by Tony England, WØORE, and other AMSAT members are part of the program featuring the latest in Amateur Radio techniques such as satellites and packet radio. In addition, a 30 minute "backgrounder" on how the video was produced will air after the main presentation. Watch for it on GTE Spacenet 1, transponder 12-H (channel 23) at 2200 UTC on Sunday, September 20. Additional copies of the video will be available from the AMSAT Video Tape Library as well as ARRL HQ.

In related news, the Westlink Radio News continues to be available worldwide via several access ports. For those with TVRO equipment, it is uplinked every Sunday evening on Spacenet 1, transponder 9H, (channel 17), on 6.3 audio as part of the FM America talk show. It's then re-uplinked from Andover, Massachusetts onto an Atlantic Intelsat and fed to Europe.

New Graphics Tracking Software Is Hit At Hamfests

The new N4HY graphics tracking program, QUIKTRAK V3.0, is now available through the AMSAT software exchange. The new package produces a detailed map-based tracking system as well as a comprehensive tabular output. It runs on IBM PCs with DOS 3.0 or later and does not require the 8087 math co-processor but will run faster if it's installed. The software commands auto-tracking rotor systems, tunes radios to compensate for Doppler shift and much more.

The new software has been the star attraction at all the conventions and hamfests it has appeared at recently probably because of its attractive graphics presentation which shows the satellite position on a map together with other vital information.

A substantial discount on this professional tracking system is available to AMSAT members. Inquire at AMSAT HQ for details. A complete list of available AMSAT tracking and data analysis software is available free from AMSAT for an SASE.



Geoff Perry, founder of the Kettering Group, spoke at Surrey on track-and-ing topics.

Space Institute and the L5 Society. AMSAT maintains close ties with NSS including the participation of NSS in AMSAT's Phase 4 program and advanced concepts such as the Lunar Polar Orbiter (LPO) program.

Three Decades Into The Space Age And Counting

The Thirtieth Anniversary of the Space Age is upon us. Sputnik was launched at 0600 Moscow time, 04 October, 1957. There is apparently some sentiment for sponsoring an activity in the Amateur Radio Satellite context in recognition of this milestone. Suggested activities have included

Short Bursts

- AO-10 has been withdrawn from service until approximately December 1 due to extremely poor sun angles and

long perigee eclipses. The overall prospects are good AO-10 will be restored to useful service on Mode B in late Autumn.

- AMSAT Engineering Vice President Jan King, W3GEY, will be in Geneva, Switzerland until late October. Jan is part of the U.S. delegation to the Mobile WARC (World Administrative Radio Conference) meeting in Geneva. HB9XJ in Zurich will be assisting Jan to stay in contact with HQ via electronic mail. Jan indicates he may try to operate 4U1ITU if circumstances allow. AMSAT DL President Karl Meinzer, DJ4ZC, will be visiting Switzerland during Jan's visit and the two plan to get together to compare notes.

- Time is running low for those who want to earn a shot at the IC-275 radio which is being given away. The winner will be the member who signs up the most new or renewing members by the end of next month. Right now the leader, with less than a dozen sign-ups, is still within reach. Who will catch him? And those who want to take advantage of the current membership rates should do so now before rates go up. By renewing now, they also get a chance on the autotrack system drawing. For further information, contact AMSAT at 301-589-6062 or write AMSAT, P.O. Box 27, Washington D.C. 20044.

- AMSAT now has self-adhesive decals for Sustaining Life Members and regular AMSAT members. These handsome decals make a proud addition to your QSL card. Inquire at AMSAT HQ.

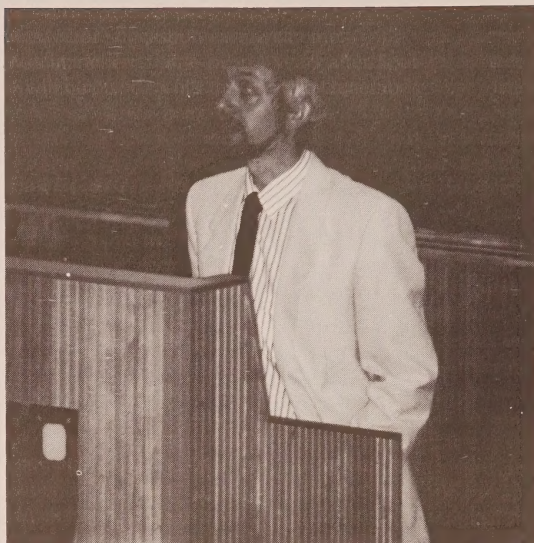
- This year's Director's election ballots have been included as postcards in ASR #155. Please follow the instructions on the postcard, mark your ballot and return the ballot promptly by simply affixing a stamp and mailing.

- RS-1, launched October 26, 1978, continues to be heard from. Latest reports of the famous "5015" telemetry block on 29.400 MHz come from Toshi, JR3FRF. He happened upon RS-1 while monitoring for RS-10 and 11. The transponder and telemetry formatter of RS-1 as well as the battery failed many years ago, but the transmitter still works. When illuminated by the sun, the solar panels provide sufficient energy for RS-1 to be heard sending its spurious telemetry.

- Frank Wiesenmeyer, K9CIS, Richland Community College EDSAT project manager and author of many articles in AMSAT publications, is home from the hospital after unexpected surgery. Frank's jaw was broken on both sides by an accident during a softball game ... he is now "retired" according to his personal manager, er, wife. GET WELL QSL cards would help his multi-week convalescence. Frank Wiesenmeyer, K9CIS 2181 Summit Court Decatur, IL 62526

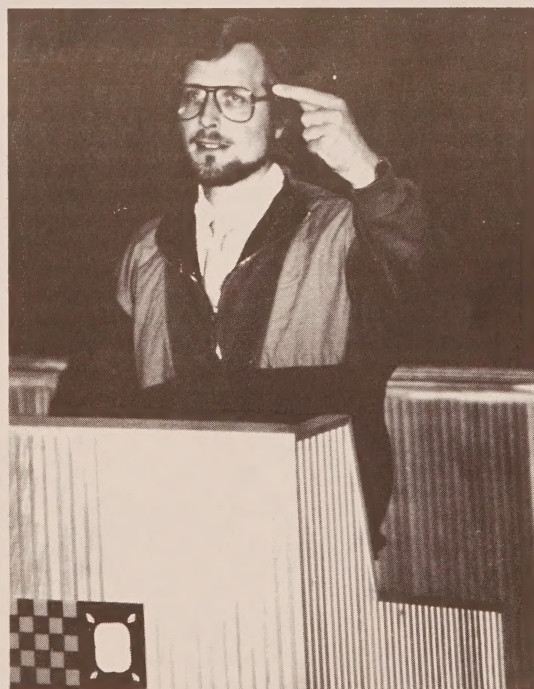
- Mode JD users are reminded the JD transponder cycles on and off every two hours during the specified operating windows given below. Many have inquired as to what the significance of the on-off times are. The switch times are when the satellite is at TCA (Time of Closest Approach) to Tokyo within a given orbit. The overall operating schedule is determined primarily by power availability and battery charge considerations.

- The WB8ELK balloon launch from Findlay, Ohio took place at 17:27 UTC on August 15. The 2 meter and 70 cm beacons were heard throughout a multistate region including Ohio, West Virginia, Indiana, Michigan, Maryland, Illinois, Pennsylvania, Ontario and New York. The payload had climbed to about 80,000 feet when the radios shut off



James Miller, G3RUH, spoke to the Colloquium at Surrey on orbital predictions.

for reasons unknown. The balloon continued its ascent to over 120,000 feet when visual contact was lost. The payload has not been recovered although it is believed to be on the ground within 20 to 25 miles of the launch site.



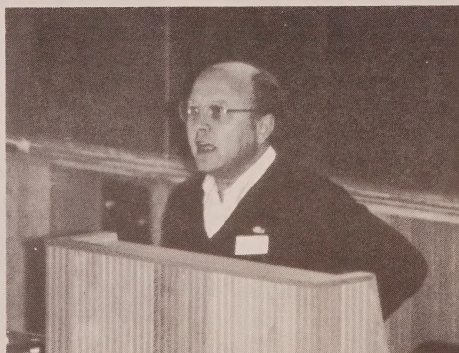
Hans Peter Kuhlen, DK1YQ, spoke to the AMSAT UK Colloquium about the RUDAK experiment on Phase 3C.

Satellite	RS-10/11	Satellite	OSCAR-10	Satellite	Salyut-7	Satellite	meteor 2-15
Catalog number	18129	Catalog number	14129	Catalog number	13138	Catalog number	17290
Epoch time:	87242.13253586	Epoch time:	87237.16139039	Epoch time:	87243.83796241	Epoch time:	87243.62021367
Element set:	77	Element set:	307	Element set:	748	Element set:	91
Inclination:	82.9309 deg	Inclination:	27.4534 deg	Inclination:	51.6117 deg	Inclination:	82.4715 deg
RA of node:	3.4302 deg	RA of node:	5.2875 deg	RA of node:	250.2931 deg	RA of node:	319.5158 deg
Eccentricity:	0.0013522	Eccentricity:	0.6025520	Eccentricity:	0.0001628	Eccentricity:	0.0012297
Arg of perigee:	75.2064 deg	Arg of perigee:	234.9523 deg	Arg of perigee:	129.3417 deg	Arg of perigee:	301.1314 deg
Mean anomaly:	285.0569 deg	Mean anomaly:	53.2653 deg	Mean anomaly:	230.5572 deg	Mean anomaly:	58.8643 deg
Mean motion:	13.71880913 rev/day	Mean motion:	2.05876461 rev/day	Mean motion:	15.31280696 rev/day	Mean motion:	13.83565176 rev/day
Decay rate:	1.09e-06 rev/day ²	Decay rate:	6.90e-07 rev/day ²	Decay rate:	1.552e-05 rev/day ²	Decay rate:	6.0e-08 rev/day ²
Epoch rev:	930	Epoch rev:	3158	Epoch rev:	30757	Epoch rev:	3296
Satellite	OSCAR-9	Satellite	OSCAR-11	Satellite	ajisai	Satellite	meteor 3-1
Catalog number	16909	Catalog number	14781	Catalog number	16908	Catalog number	16191
Epoch time:	87238.83946838	Epoch time:	87235.21565636	Epoch time:	87220.37431124	Epoch time:	87243.68851703
Element set:	59	Element set:	249	Element set:	50	Element set:	693
Inclination:	50.0158 deg	Inclination:	98.0936 deg	Inclination:	50.0057 deg	Inclination:	82.5508 deg
RA of node:	168.1620 deg	RA of node:	299.7426 deg	RA of node:	224.8472 deg	RA of node:	339.2500 deg
Eccentricity:	0.0011108	Eccentricity:	0.0012258	Eccentricity:	0.0011307	Eccentricity:	0.0020445
Arg of perigee:	105.5591 deg	Arg of perigee:	248.5978 deg	Arg of perigee:	60.8005 deg	Arg of perigee:	131.6134 deg
Mean anomaly:	254.6460 deg	Mean anomaly:	111.3904 deg	Mean anomaly:	299.3959 deg	Mean anomaly:	228.6760 deg
Mean motion:	12.44394100 rev/day	Mean motion:	14.62149346 rev/day	Mean motion:	12.44369066 rev/day	Mean motion:	13.16929710 rev/day
Decay rate:	-2.5e-07 rev/day ²	Decay rate:	9.70e-07 rev/day ²	Decay rate:	-2.5e-07 rev/day ²	Decay rate:	4.3e-07 rev/day ²
Epoch rev:	4718	Epoch rev:	18549	Epoch rev:	4489	Epoch rev:	8924
Satellite	mir	Satellite	RS-5	Satellite	Cosmos 1870	Satellite	noaa-9
Catalog number	16609	Catalog number	12999	Catalog number	18225	Catalog number	15427
Epoch time:	87243.86459057	Epoch time:	87239.01434186	Epoch time:	87236.93636151	Epoch time:	87241.96257553
Element set:	799	Element set:	430	Element set:	59	Element set:	192
Inclination:	51.6301 deg	Inclination:	82.9542 deg	Inclination:	71.9324 deg	Inclination:	99.0572 deg
RA of node:	127.6127 deg	RA of node:	229.8035 deg	RA of node:	39.5340 deg	RA of node:	208.2541 deg
Eccentricity:	0.0036919	Eccentricity:	0.0007895	Eccentricity:	0.00079190	Eccentricity:	0.0015682
Arg of perigee:	85.1442 deg	Arg of perigee:	232.2556 deg	Arg of perigee:	265.1242 deg	Arg of perigee:	1.8363 deg
Mean anomaly:	275.4373 deg	Mean anomaly:	127.7862 deg	Mean anomaly:	94.7318 deg	Mean anomaly:	357.8676 deg
Mean motion:	15.79667473 rev/day	Mean motion:	12.05057192 rev/day	Mean motion:	16.08184600 rev/day	Mean motion:	14.11527526 rev/day
Decay rate:	2.4866e-04 rev/day ²	Decay rate:	1.2e-07 rev/day ²	Decay rate:	6.9235e-04 rev/day ²	Decay rate:	5.9597e-04 rev/day ²
Epoch rev:	8798	Epoch rev:	25036	Epoch rev:	492	Epoch rev:	13972
Satellite	OSCAR-8	Satellite	RS-7	Satellite	meteor 2-14	Satellite	noaa-10
Catalog number	12888	Catalog number	13001	Catalog number	16735	Catalog number	16969
Epoch time:	87239.51385779	Epoch time:	87240.05066712	Epoch time:	87151.37312472	Epoch time:	87239.38252770
Element set:	70	Element set:	338	Element set:	126	Element set:	73
Inclination:	97.6453 deg	Inclination:	82.9569 deg	Inclination:	82.5365 deg	Inclination:	98.7148 deg
RA of node:	258.8750 deg	RA of node:	221.1704 deg	RA of node:	120.7966 deg	RA of node:	269.1083 deg
Eccentricity:	0.0002050	Eccentricity:	0.0022532	Eccentricity:	0.0013863	Eccentricity:	0.0013951
Arg of perigee:	8.3592 deg	Arg of perigee:	136.5595 deg	Arg of perigee:	316.5134 deg	Arg of perigee:	7.0526 deg
Mean anomaly:	351.7701 deg	Mean anomaly:	223.7262 deg	Mean anomaly:	43.4938 deg	Mean anomaly:	353.0845 deg
Mean motion:	15.29997657 rev/day	Mean motion:	12.08702445 rev/day	Mean motion:	13.83753288 rev/day	Mean motion:	14.22512138 rev/day
Decay rate:	3.287e-05 rev/day ²	Decay rate:	1.3e-07 rev/day ²	Decay rate:	6.0e-08 rev/day ²	Decay rate:	2.04e-06 rev/day ²
Epoch rev:	32734	Epoch rev:	25124	Epoch rev:	5103	Epoch rev:	4886

AMSAT® NA

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Dr. Karl Meinzer, DJ4ZC, described an idea for Phase 3D at the Surrey Colloquium.

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